AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A process for producing a barrier film by a heat CVD method which comprises the steps of:

providing a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus;

heating said substrate;

introducing a feedstock gas slected from tungsten hexafluoride gas and $W(CO)_6$ gas ~~having a high temperature-melting point metal in its structure~~, [[and]] a reductive nitrogen-containing gas selected from among N_2H_4 gas, NF_3 gas, N_20 gas, and NH_3 gas, ~~comprising a nitrogen atom~~ a nitrogen free auxiliary reductive gas selected from among SiH_4 gas, H_2 gas, Si_2H_6 gas, PH_3 gas, and B_2H_6 gas into said vacuum atmosphere[[; and]] ~~forming~~ so as to form a film of the tungsten nitride ~~of said high temperature-melting point metal~~ on said substrate~~, wherein said step of forming said film of the nitride includes a plasma-free formation of said film;~~,

wherein 0_2 gas ~~a nitrogen-free auxiliary reductive gas~~ is introduced into said vacuum atmosphere.

Claim 2 (Canceled)

3. (Currently Amended): A process for producing a barrier film by the heat CVD method comprising the steps of:

providing a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus;

heating said substrate;

introducing a feedstock gas selected from among tungsten hexafluoride gas and $W(CO)_6$ gas, ~~having a high temperature-melting point metal in its structure~~ a reductive nitrogen-containing gas selected from among N_2H_4 gas, NF_3 gas, N_20 gas, and NH_3 gas, a nitrogen free auxiliary reductive gas selected from among SiH_4 gas, H_2 gas, Si_2H_6 gas, PH_3 gas and B_2H_6 gas into said vacuum atmosphere[[; and]]

~~forming~~ so as to form a film of the tungsten nitride ~~of said high temperature-melting point metal~~ on said substrate, wherein ~~said step of forming said film of the nitride includes~~ said tungsten nitride film is formed by a plasma-free formation ~~of said film~~,

wherein 0_2 gas is introduced into said vacuum atmosphere,

~~wherein a nitrogen-free auxiliary reductive gas is introduced into said vacuum atmosphere, said nitrogen-free auxiliary reductive gas being introduced together with said feedstock gas into said vacuum atmosphere.~~

Claim 4 (Currently Amended): The process for producing a barrier film by the heat CVD method according to claim [[2]]1, wherein, ~~in the step of introducing said auxiliary reductive gas together with said reductive nitrogen-containing gas and said feedstock gas,~~ said reductive nitrogen-containing gas is introduced at a flow rate once or more higher than the flow rate of said feedstock gas, and said nitrogen free auxiliary reductive gas is introduced at a flow rate once or more but not more than 10 times higher than the flow rate of said reductive nitrogen-containing gas.

Claim 5 (Currently Amended): The process for producing a barrier film by the heat CVD method according to claim 1, wherein, ~~in the step of introducing said auxiliary reductive gas together with said reductive nitrogen-containing gas and said feedstock gas,~~ said reductive nitrogen-containing gas is introduced at a flow rate once or more but not more than 5 times higher than the flow rate of said feedstock gas, and said nitrogen free auxiliary reductive gas is introduced at a flow rate 2 times or more but not more than 10 times higher than the flow rate of said reductive nitrogen-containing gas.

Claim 6 (Currently Amended): The process for producing a barrier film by the heat CVD method according to claim [[2]]1, wherein, ~~in the step of introducing said auxiliary reductive gas together with said reductive nitrogen-containing gas and said feedstock gas,~~ said nitrogen free auxiliary reductive gas is introduced at a flow rate once or more but not more than 15 times higher than the flow rate of the feedstock gas ~~having said high temperature-melting point metal~~.

Claim 7 (Currently Amended): The process for producing a barrier film by the heat CVD method according to claim **1**, wherein~~, in the step of growing the film of the nitride of said high temperature-melting point metal, a diluent gas not reacting with said high temperature-melting point metal and a gas having an oxygen atom in its chemical structure are introduced so that~~ the pressure of said vacuum atmosphere is regulated to 1 Pa or more but not more than 100 Pa when said tungsten nitride film is formed.

Claim 8 (Currently Amended): The process for producing a barrier film by a heat CVD method according to claim 1, further comprising the steps of:

forming a barrier film made of a film of the tungsten nitride~~ of a high temperature-melting point metal~~ on a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus;

exposing the surface of said substrate to a plasma of hydrogen gas and a plasma containing at least one gas selected from among argon, nitrogen and helium gases; and then forming the film of the tungsten nitride ~~of said high temperature-melting point metal~~ on the surface of the substrate,

wherein the step of forming the film includes the step of heating the substrate.

Claim 9 (Withdrawn): A barrier film comprising a thin nitride film of a high temperature-melting point metal, wherein[[;]]

said thin nitride film has a content of said high temperature-melting point metal exceeding the stoichiometric composition ratio thereof.

Claim 10 (Withdrawn): A barrier film comprising a thin nitride film of a high temperature-melting point metal formed on a substrate and aiming at preventing the diffusion of metals in an interconnecting thin film formed on said thin nitride film, wherein[[;]]

said thin nitride film is free from silicon.

Claim 11 (Currently Amended): A process for producing a barrier film which comprises the steps of:

providing a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus;

heating said substrate;

introducing a feedstock gas selected from tungsten hexafluoride gas and $W(CO)_6$ gas ~~having a high temperature melting point metal in its structure~~, and a NH_3 gas, and a reductive gas selected from SiH_4 gas and Si_2H_6 gas into said vacuum atmosphere[[; and]] ~~forming~~ so as to form a film of the tungsten nitride ~~of said high temperature-melting point metal~~ on said substrate~~, wherein said step of forming said film of the nitride includes a plasma-free formation of said film, wherein a reductive Si-containing gas is introduced into said vacuum atmosphere~~.

Claim 12 (Cancelled)

Claim 13 (Currently Amended): The process for producing a barrier film, comprising the steps of:

providing a substrate on a substrate holder in a vacuum atmosphere within a CVD apparatus;

heating said substrate;

introducing a feedstock gas selected from tungsten hexafluoride gas and $W(CO)_6$ gas, and a NH_3 gas, and a reductive gas selected from SiH_4 gas and Si_2H_6 gas ~~having a high temperature-melting point metal in its structure~~ into said vacuum atmosphere[[; and]]

~~forming~~ so as to form a film of the tungsten nitride ~~of said high temperature-melting point metal~~ on said substrate, wherein ~~said step of forming said film of the nitride includes~~ said tungsten nitride film is formed by a plasma-free formation ~~of said film;~~

~~wherein a reductive Si-containing gas is introduced into said vacuum atmosphere, said reductive Si-containing gas being introduced together with said feedstock gas into said vacuum atmosphere~~.

Claim 14 (Currently Amended): The process for producing a barrier film according to claim 12, wherein~~, in the step of introducing said reductive Si-containing gas together with said NH_3 gas and said feedstock gas,~~ said NH_3 gas is introduced at a flow rate once or more higher than the flow rate of said feedstock gas, and said reductive Si-containing gas is introduced at a flow rate once or more but not more than 10 times higher than the flow rate of said NH_3 gas.

Claim 15 (Currently Amended): The process for producing a barrier film according to claim 11, wherein~~, in the step of introducing said reductive Si-containing gas together with said NH_3 gas and said feedstock gas,~~

said NH_3 gas is introduced at a flow rate once or more but not more than 5 times higher than the flow rate of said feedstock gas, and said reductive Si-containing gas is introduced at a flow rate 2 times or more but not more than 10 times higher than the flow rate of said NH_3 gas.

Claim 16 (Currently Amended): The process for producing a barrier film according to claim 12, wherein~~, in the step of introducing said reductive Si-containing gas together with said NH_3 gas and said feedstock gas,~~ said reductive Si-containing gas is introduced at a flow rate once or more but not more than 15 times higher than the flow rate of the feedstock gas ~~having said high temperature-melting point metal~~.

Claim 17 (Currently Amended): The process for producing a barrier film according to claim 11, wherein~~, in the step of growing the film of the nitride of said high temperature-melting point metal, a diluent gas not reacting with said high temperature-melting point metal and a gas having an oxygen atom in its chemical structure are introduced so that~~ the pressure of said vacuum atmosphere is regulated to 1 Pa or more but not more than 100 Pa <u>when said tungsten nitride film is formed</u>.